

What is Claimed is:

1. A method for atomizing a formative fluid to form a selected material, comprising:

providing in a liquid state and at a first selected temperature and a first selected pressure, the formative fluid which is capable of forming the selected material;

pressurizing the formative fluid in the liquid state to a second selected pressure;

directing the formative fluid in the liquid state to a fluid conduit having an input end and an output end, wherein the output end includes an outlet port being oriented to direct the formative fluid to a material formation region at a third selected pressure below the second selected pressure;

regulating the temperature of said formative fluid as it passes through the fluid conduit so as to maintain the formative fluid in the fluid conduit in the liquid state at a second selected temperature which is below the supercritical temperature ( $T_c$ ) of the formative fluid, the second selected temperature being selected to promote or control atomization of the formative fluid when it exits the output end of the fluid conduit; and

directing the liquid formative fluid through the outlet port of the fluid conduit into the formation region so as to produce an atomized spray.

2. The method according to Claim 1 wherein said formative fluid comprises a solution of at least one formative compound in a carrier liquid, the formative compound being capable of forming said selected material in the formation region.

3. The method according to Claim 2 wherein said formative compound is capable of reacting in the formation region to form the selected material.

4. The method according to Claim 3 wherein said atomized spray is supplied with sufficient energy in the formation region

to promote reaction of the formative compound to form the selected material.

5. The method according to Claim 1 wherein said formative fluid forms a powder in the formation region.

6. The method according to Claim 1 wherein a substrate is positioned within the formation region such that the selected material forms as a coating on the substrate.

7. The method according to Claim 1 further comprising a gas supply means for admixing at least one gas into the atomized formative fluid in the formation region.

8.. The method according to Claim 7 wherein the gas supply means admixes at least one gas reactive with at least one component of the formative fluid to form the selected material.

9. The method according to Claim 4 wherein the energy is a flame source which causes combustion of at least one component of said formative fluid.

10. The method according to Claim 1 wherein said third selected pressure is ambient pressure.

11. The method according to Claim 1 wherein said third selected pressure is above ambient pressure.

12. The method according to Claim 1 wherein said third selected pressure is above ambient pressure.